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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/040,822	01/07/2002	Dennis J. O'Rear	09/608261US1	3773

32223 7590 10/01/2003

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EXAMINER

DANG, THUAN D

ART UNIT PAPER NUMBER

1764

DATE MAILED: 10/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/040,822	O'REAR ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Thuan D. Dang	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 January 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 October 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

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## DETAILED ACTION

### *Election/Restriction*

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-34, drawn to a process of making an olefinic composition, classified in class 585, subclass 324.
- II. Claim 35, drawn to a product mixture, classified in class 585, subclass 16.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product can be made by another and materially different process, such as hydrogenation of multiple double bonds hydrocarbons including acetylenic compounds and dienes.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with Ms. Karen Reed on 9/25/03 a provisional election was made with traverse to prosecute the invention of group I, claim 1-34. Affirmation of this

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election must be made by applicant in replying to this Office action. Claim 35 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### ***Drawings***

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: figures 1 and 2 have too many errors since the specification and drawings have different numbers for the same structure. For example, distillation column 32 on line 11 of page 34 is column 22 in figure 1. Applicants are strongly suggested to review the description of drawings and drawing carefully to amend these errors. Correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 1-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding dehydrogenation step of claims 1 and 32-34, the expression "no greater than" makes these claims indefinite since this expression also means a conversion of 0%. If so, the following step "contacting" becomes unnecessary since no internal olefins are converted in this step. Applicants are suggested to amend these claims by reciting the lower conversion.

The term "Fischer-Tropsch type" recited in claims 5 and 29-32 are unacceptable since it has been held that a claim is indefinite if in the claim the word "type" is appended to an otherwise definite expression. See *Ex parte Copenhaver* 109 U.S.P.Q. 118.

Regarding claims 6 and 7 which depend on claim 1, while claim 1, applicants do not recite the hydrocarbon mixture containing organic sulfur compounds, oxygenates, and olefins, it is unclear why the hydrocarbon mixture must be pretreated to remove these unwanted compounds.

Regarding claims 7, 8, and 11 which depend on claim 1, while claim 1, applicants do not recite the dehydrogenation product containing dienes, especially conjugated dienes it is unclear why the dehydrogenation product must be pretreated to remove these unwanted compounds. Note that in step (b) of claim 1, the expression "minimizing the amount of dienes produced" may be interpreted as the product contains no dienes.

Regarding claim 23, the expression "within about 25 carbons of the linear paraffinic fraction of said hydrocarbon fraction" is totally not understood by the examiner since it is unclear how many carbons the alpha olefin has.

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Regarding claim 31, it is unclear whether the Kobbel-Englehardt reaction is a specific F-T reaction or not.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 23, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Forschner et al (5,093,540).

Forschner discloses a process of including a step of cracking and dehydrogenating a linear C<sub>4-30</sub> paraffinic feed, namely Hexadecane (col. 10, lines 7-13) at a conversion of less than 50% to a dehydrogenation product containing substantially amount of internal olefins and then a step of ethenolysis of internal olefins in the dehydrogenation product to alpha-olefins of 6 carbons (the abstract; col. 1, lines 23-30; col. 1 line 65 thru col. 2, line 39; col. 7, line 30 thru col. 8, line 63; tables 1 and 2).

On column 10, lines 7-9, Forschner clearly discloses that the paraffin feed contains only hexadecane.

On column 8, lines 16-18, Forschner discloses that the alpha olefins are recovered by distillation.

The condition of temperature, pressure and space velocity of the dehydrogenation-cracking step is disclosed by Forschner on column 2, line 62 thru col.3, line 6.

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***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 21, 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forschner et al (5,093,540).

Forschner discloses a process as discussed above.

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Forschner discloses the temperature and the pressure of the ethenolysis on page 8, lines 8-15 and the presence of ruthenium and tungsten in the catalyst on page 8, lines 27 and 46.

It appears that Forschner is silent as the space velocity used for the reaction (see the whole patent to Forschner for detail). However, the space velocity is only reaction parameter which must be selected to optimize the process.

Forschner appears not disclose the recycle of unreacted paraffins and internal olefins to the dehydrogenation step. However, once the prior art dehydrogenation product contains unreacted reactants, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Forschner process by recycling these unreacted components to reduce the cost of raw material.

Claims 5-20, 22, and 29-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Forschner et al (5,093,540) in view of Benham et al (5,324,335).

Forschner discloses a process as discussed in the above 102 rejection.

Forschner does not disclose that the paraffinic feed are paraffins produced by F-T process. However, Benham et al disclose a process to produce paraffin wax of 20 carbons by a reforming step of a starting methane into syngas which is then used as a feed to produce a F-T product (see figure 1; col. 14, line 30 thru col. 15, line 38).

It would have been obvious to one having ordinary skill in the art at the time the invention was made by employing the F-T paraffins as the Forschner dehydrogenation paraffinic feed since it is expected that using any paraffin for the Forschner process yields similar results.



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The examiner notes that Forschner discloses that in addition to the paraffin wax, the Benham F-T process also produce other such as naphtha, and diesel fuel. Also Forschner does not disclose that these fuels are hydrotreated. However, it is well-known that naphtha and diesel are hydroisomeried or hydrodesulfurized to increase the octane number or decrease the the amount of sulfur.

Forschner does not disclose that the paraffin is pretreated to remove or convert sulfur, oxygenates and olefins into other forms before the dehydrogenation step. However, Forschner does not disclose the presence of these compounds in the starting feed (see the whole patent to Forschner).

Once, the paraffin of Benham used as the paraffinic starting material for the Forschner process contains these undesired compounds, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modified the Forschner process having been modified by Benham teachings by removing these undesired components by well-known methods such as hydrogenation since during the hydrogenation reaction, only paraffins participate in the reaction.

Similarly, Forschner does not disclose removing dienes from the dehydrogenation product before the ethenolysis since the Forschner dehydrogenation product does not contain no dienes (see the whole patent to Forschner).

Once, the Forschner dehydrogenation product contains these dienes, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modified the Forschner process having been modified by Benham teachings by removing these undesired components by well-known methods such as selective diene hydrogenation, adsorption,

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dienophile adduct formation claimed by applicants since during the ethenolysis reaction, only olefins participate in the reaction.

Claims 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Forschner et al (5,093,540) in view of Wilhelm (4,046,715).

Forschner discloses a process as discussed above.

Forschner does not disclose that the dehydrogenation catalyst contains group VIII noble metal. However, Wilhelm discloses a dehydrogenation catalyst contains group VIII noble metal (the abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Forschner process by adding group VIII metal into the Forschner catalyst since the Wilhelm catalyst shows a superior performance (col. 3, lines 32-45).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thuan D. Dang whose telephone number is 703-305-2658. The examiner can normally be reached on Mon-Thu.

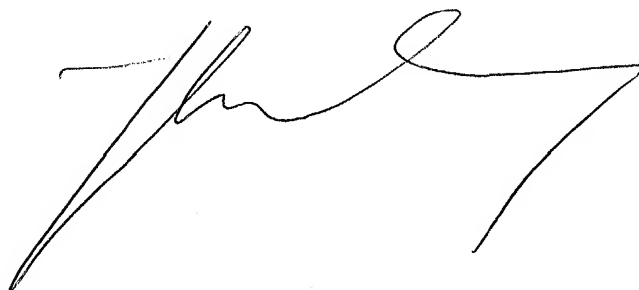
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 703-308-6824. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Thuan D. Dang  
Primary Examiner  
Art Unit 1764

10040822.1<sup>st</sup>  
September 29, 2003

A handwritten signature in black ink, appearing to read 'Thuan D. Dang', with a stylized, sweeping flourish extending to the right.